

INSTRUCTIONS



GEMINI DIGITAL FULL FEATURED PWM DRIVES



INTRODUCTION

This PWM dc drive is digitally controlled by a single chip microprocessor. The standard software creates a drive controller that controls the speed of a dc motor by controlling its armature voltage. It has adjustable Acceleration control, adjustable Current limit, and IR compensation to provide speed regulation with varying loads. A logic input is provided for enabling the control. The Gemini full featured PWM drives are designed for operation with brush type permanent magnet motors. Models are available for both 120 volt AC and 240 volt AC lines. Ratings of specific models are found in Catalog sheets or on the Internet at www.geminicontrols.com

GENERAL

These instructions provide basic information for installation and adjustment. Please contact Gemini Corporation if further information is necessary. It is possible to damage the drive through misuse or misapplication. Do not use the drive with motors larger than it is rated for. Please read these instructions thoroughly before proceeding with installation

Unpack the equipment noting any shortages or damage. Immediately notify the carrier of any damages. Store in a clean dry location if the drive is not used immediately. Relative humidity should not exceed 95%, non condensing.

INSTALLATION

Carefully mount the chassis, allowing clearances for access, air flow and conduit entry. The environment should be free of vibration and contamination. Operating temperature range for the Gemini drive is 32 to 104 degrees Fahrenheit or 0 to 40 degrees C. Since the drive produces heat, use a cooling source, such as a fan, if the ambient temperature is expected to reach 104 degrees

WARNING. This motor control contains a high voltage DC bus with considerable capacitance and a large amount of stored energy. Direct contact with this bus can be very dangerous and even lethal. Do not touch any of the electrical conductors or connections to the control when power is on, or for at least 5 minutes after removal of power. Use insulated tools for adjustments.

WIRING : Observe figure 1 for location of external connections.

Connect the AC line to the terminals labeled L1 and L2. Follow all local and national electrical codes for wire size and for branch circuit protection. Be careful not to connect the incoming AC to the motor terminals.

The motor is connected to terminals labeled A+ and A-. A fuse on the board provides motor protection. Do not operate the drive without the motor connected.

The speed control is a 10K $\frac{1}{4}$ Watt or more potentiometer connected to the L, W, and H terminals, with the wiper of the pot connected to the W terminal, and the CCW end of the pot to the L terminal.

If an external 0-5 volts DC speed reference signal is used, first set up and adjust the system with a 10K potentiometer as the speed signal. Connect the **ISOLATED** external signal only after satisfactory operation has been obtained with a potentiometer, so that any subsequent problem can be directed to the interface. Wire the negative external reference to L and the positive to W. If a 0-10 volt DC Speed reference signal is needed Gemini has a adapter board available to handle this.

If shielded wire is used connect the shield to the potentiometer. Do not connect both ends of the shield. Do not run speed control wiring in the same conduit as the power wiring either to or from the drive.

The drive has a logic input for enabling the control. If you wish to use the enable just connect a switch to terminals QC1 & QC2. Otherwise a wire may be connected between terminals QC1 & QC2. This enables the drive all the tim.

STARTUP: Refer to the adjustments described below.

Turn the TORQUE BOOST, MAX SPEED, and the speed control potentiometer to the extreme counterclockwise positions. Turn the CURRENT LIMIT to the approximate middle position.

Apply power and rotate the speed potentiometer slightly clockwise. Observe the direction of rotation. If incorrect, turn off the power and reverse the motor connections.

Rotate the speed potentiometer to the extreme clockwise position and adjust the MAX SPEED for the desired maximum speed, or for rated armature voltage as measure with a voltmeter at the motor terminals.

Run the motor at approximately 10 percent speed and adjust the TORQUE BOOST clockwise until the motor starts to “surge”. Back off on the adjustment until the motor just stops surging. The system is now ready for operation,

ADJUSTMENTS

There are five adjustments available to the user to provide the optimum operation of the drive. These are shown on figure 1, and are described as follows:

MIN SPEED P1: This adjustment adjusts for minimum speed when the main speed control is adjusted at its lowest setting. Some applications are not designed to go to zero speed at any time, and this adjustment prevents operation at zero speed even when the main speed setter is set to zero. Clockwise adjustment increases the minimum speed.

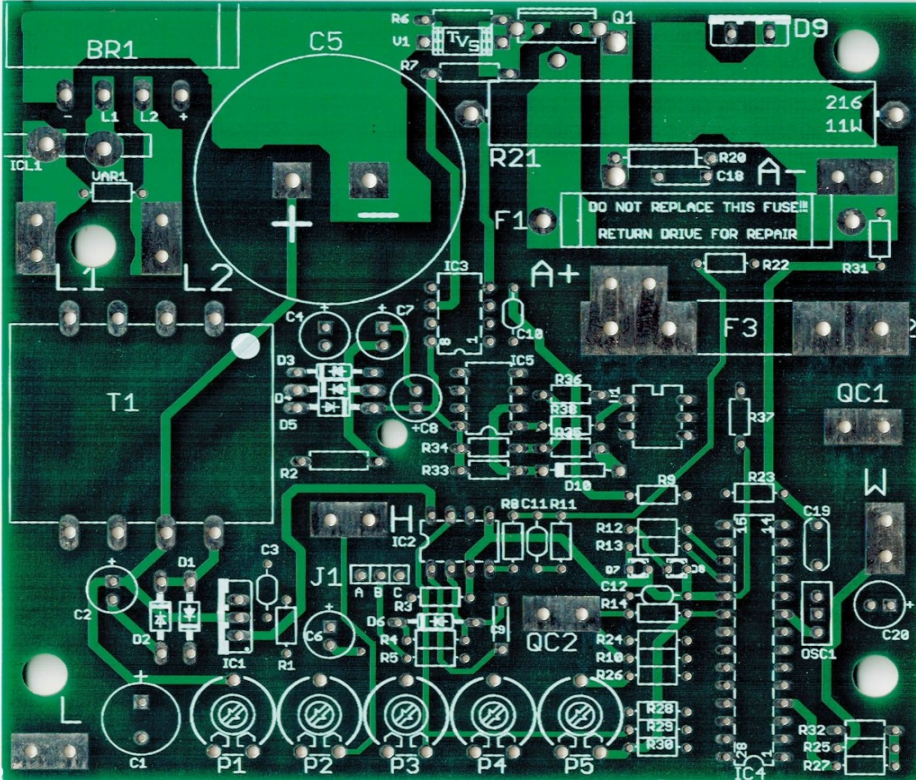
MAX SPEED P2: This adjustment adjusts for the maximum speed when the main speed control is set to its highest setting. It accommodates variations in motors and allows the user of the drive to prevent over speed or to insure that maximum speed is available. Clockwise adjustment increases the maximum speed

CURRENT LIMIT P3: This adjustment regulates the maximum amount of current that the drive will deliver to the load under any circumstances. It is useful in preventing damage to a load where too much torque might be mechanically destructive, and it prevents damage to the drive if a temporary overload stalls the drive.

ACCEL P4: This adjustment regulates the rate at which the drive will speed up and slow down in response to an increase or decrease in the speed setting. Adjust for the desired rate.

TORQUE BOOST P5: This adjustment regulates how the drive responds to changes in load. If properly adjusted, load changes will have little if any effect on the speed of the drive. This adjustment is best made on a trial and error basis, with clockwise rotation giving the best regulation. If set too far clockwise, the drive speed may increase with load and may even become unstable. If instability occurs, reduce the setting of this adjustment in the counterclockwise direction.

FIGURE 1



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